

WHAT IS CLAIMED IS:

1. A charging circuit in a back-up power system, comprising:
 - an output terminal electrically connected to a main power for providing an AC output voltage;
 - a transformer having a secondary electrically connected to said output terminal;
 - an electrical energy storage and supply device providing a DC current;
 - an inverter having an output end electrically connected to a primary of said transformer and an input end electrically connected to said electrical energy storage and supply device and comprising four gate control switch devices to form a bridge switching device, wherein said four gate control switch devices respectively have an anti-parallel diode;
 - a first diode having an anode electrically connected to one output terminal of said bridge switching device;
 - a second diode having an anode electrically connected to the other output terminal of said bridge switch device; and
 - a charging switch device having a first conducting terminal electrically connected to a common cathode of said first and said second diodes and a second conducting terminal electrically connected to a negative electrode of said electrical energy storage and supply device so as to charge said electrical energy storage and supply device through a conduction and a cut-off of said charging switch device.
2. The charging circuit according to claim 1, wherein said electrical energy storage and supply device is a battery.
3. The charging circuit according to claim 1, wherein each said gate control switch device is a power MOSFET and said anti-parallel diode is an intrinsic

anti-parallel diode of said power MOSFET.

4. The charging circuit according to claim 1 further comprising a fixed switch electrically connected between said main power and said output terminal for determining one of a conduction and a cut-off therebetween according to a control signal.

5. The charging circuit according to claim 1, wherein said back-up power system is a line-interactive uninterruptible power supply system.

6. The charging circuit according to claim 1, wherein said back-up power system further comprises a current limiting resistor electrically connected with said charging switch device in series.

7. A charging circuit in a back-up power system, comprising:

an output terminal electrically connected to a main power for providing therefrom an AC output voltage;

a transformer having a secondary electrically connected to said output terminal;

an electrical energy storage and supply device providing a DC voltage;

an inverter having an output end electrically connected to a primary of said transformer and an input end electrically connected to said electrical energy storage and supply device and comprising four gate control switch devices to form a bridge switching device, wherein said gate control switch devices respectively have an anti-parallel diode;

a bridge rectifier having an input end electrically connected to said output end of said inverter in parallel; and

a charging switch device electrically connected to an output end of said bridge rectifier in parallel so as to charge said electrical energy storage and supply device through a conduction and a cut-off of said charging switch

device.

8. The charging circuit according to claim 7, wherein said electrical energy storage and supply device is a battery.

9. The charging circuit according to claim 7, wherein each said gate control switch device is a power MOSFET and said anti-parallel diode is an intrinsic anti-parallel diode of said power MOSFET.

10. The charging circuit according to claim 7 further comprising a fixed switch electrically connected between said main power and said output terminal for determining one of a conduction and a cut-off therebetween according to a control signal.

11. The charging circuit according to claim 7, wherein said back-up power system is a line-interactive uninterruptible power supply system.

12. The charging circuit according to claim 7, wherein said back-up power system further comprises a current limiting resistor electrically connected to said charge switch device in series.